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10/594,040	09/25/2006	Hideyuki Wada	Q96670	8971
23373	7590	04/14/2011	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			MUNOZ, ANDRES F	
			ART UNIT	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sughrue@sughrue.com  
PPROCESSING@SUGHRUE.COM  
USPTO@SUGHRUE.COM

<b>Office Action Summary</b>	<b>Application No.</b> 10/594,040	<b>Applicant(s)</b> WADA ET AL.	
	<b>Examiner</b> Andres Muñoz	<b>Art Unit</b> 2894	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2011.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 4,6-8,10-13,15 and 17 is/are pending in the application.
- 4a) Of the above claim(s) 7,8 and 10-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4,6,15 and 17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20101214</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 7, 8 and 10-13 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim(s). Election was made **without** traverse in the reply filed on 09/13/2010.

### ***Claim Objections***

2. Claims are objected to because of the following informalities:
  - a. Claims 4, 6, 15 and 17: please change "said (wiring) board" to --said through wiring board-- in lines 2, 4, 2 and 2, respectively.
  - b. Claim 6: "forming a through hole opened through said board" in line 4 is unclear.Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. **Claims 6, 15 and 17** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Re claim 6**, "forming a through extension wiring on said at least one surface of said insulating resin layer" in line 9 is unclear because "said at least one surface of said insulating resin layer" lacks proper antecedent basis.

**Re claims 15 and 17**, "said through wiring" lacks proper antecedent basis.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 4 and 6** are rejected under 35 U.S.C. 102(e) as being anticipated by Imaoka (of record, US 2004/0245649 A1).

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

**Re claim 4**, Imaoka discloses (Fig. 3) a through wiring board comprising:  
a through hole (32) formed in said wiring board (10/30/20) (Fig. 5B, [0078]);  
an insulating resin layer (26, [0050-0051]) formed on (directly) all of at least one surface (bottom of Fig. 3) of said through wiring board, except for the area where said

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through hole is opened and wherein said insulating resin is not formed on any surfaces in said through hole (Figs. 5B & 6A, [0078], [0080]);

a through extension wiring (38) with which said through hole is completely filled (with 40 & 42) and which is formed on (indirectly) said insulating resin layer (26) on said at least one surface of said through wiring board to extend (as 40 & 42) to a position at a predetermined distance from said through hole (Fig. 6C, [0082-0083]); and

a bump (50) having a conductivity, formed on said through extension wiring (38) and located in a position other than the position where said through hole is opened (Fig. 3, [0085]).

**Re claim 6**, Imaoka discloses (Figs. 5A-7B) a method of manufacturing a through wiring board comprising:

forming a through hole (32) opened through said board (10/30/20) (Fig. 5B, [0078]);

forming an insulating resin layer (26, [0050-0051]) on (directly) all of at least one surface (bottom of Fig. 3) of said through wiring board except for the area where said through hole is opened and wherein said insulating resin is not formed on any surfaces in said through hole (Figs. 5B & 6A, [0078], [0080]);

forming a through extension wiring (38) on (indirectly) said at least one surface of said insulating resin layer to completely fill (with 40 & 42) said through hole and extend (as 40 & 42) to a position at a predetermined distance from said through hole (Fig. 6C, [0082-0083]); and

forming a bump (50) having a conductivity on said through extension wiring (38) in a position other than the position where said through hole is opened (Fig. 3, [0085]).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 4, 6, 15 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takao (of record, US 2004/0137701 A1) in view of Hanaoka et al. (of record, hereinafter "Hanaoka", US 2002/0030245 A1) and Hwang et al. (hereinafter "Hwang", US 2003/0170985 A1).

**Re claim 4**, Takao discloses a through wiring board comprising:

a through hole (17) formed in said wiring board (10) (Fig. 4, [0057], under broadest reasonable interpretation, hole 17 extends fully through layer 10, therefore meets the limitations as claimed);

a through extension wiring (20/21) with which said through hole is completely filled (20 completely fills 17) and which is formed on one surface of said through wiring board (bottom of Fig. 5) to extend (as 21) to a position at a predetermined distance from said through hole (Fig. 5, [0059-0062], "form...20 and...21 simultaneously"); and

a bump (23) having a conductivity, formed on said through extension wiring (20/21) and located in a position (overlying 16 in this case) other than the position where said through hole is opened (Fig. 8B, [0065]).

Takao does not disclose:

- an insulating resin layer formed on all of at least one surface of said through wiring board, except for the area where said through hole is opened and wherein said insulating resin layer is not formed on any surfaces in said through hole.

- a through extension wiring formed on "said insulating resin layer on said at least one surface of said through wiring board".

Hanaoka discloses:

- an insulating layer (40) formed on all of at least on surface (bottom of Fig. 6B, for example) of said through wiring board (6), except for the area (52) where said through hole (4) is opened and wherein said insulating layer is not formed on any surfaces in said through hole (Fig. 7A, for example) ([0142-0149]).

- a through extension wiring (8/18) formed on (indirectly) said insulating layer on said at least one surface of said through wiring board (Figs. 10A, [0123], [0149-0152], [0165]. Including layer 40 of Hanaoka in the device of Takao implicitly meets the limitations as claimed, since as understood, said layer 40 of Hanaoka is included in Takao prior to defining the through extension wiring and through hole).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to include the arrangement/insulating layer of Hanaoka to the device of Takao so

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as to enable means for forming a through hole in a patterning method as disclosed by Hanaoka.

Takao/Hanaoka fails to disclose:

- said insulating layer as "an insulating resin layer".

Hwang discloses:

- an insulating resin layer (108, [0026], [0028]. The examiner relies in Hwang for disclosure of a suitable/known layer used in a patterning method applicable to that of Takao/Hanaoka).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to include the insulating resin layer of Hwang to the device of Takao/Hanaoka so as to employ a known and suitable material employed in patterning methods and capable of withstanding processing conditions as disclosed by Hwang.

**Re claim 6**, Takao discloses a method of manufacturing a through wiring board comprising:

forming a through hole (17) opened through said board (10) (Fig. 4, [0057], under broadest reasonable interpretation, hole 17 extends fully through layer 10, therefore meets the limitations as claimed);

forming a through extension wiring (20/21) on said at least one surface of said through wiring board (bottom of Fig. 5) to completely fill (20 fills 17) said through hole and extend (as 21) to a position at a predetermined distance from said through hole (Fig. 5, [0059-0062], "form...20 and...21 simultaneously"); and



forming a bump (23) having a conductivity on said through extension wiring (20/21) in a position (overlying 16 in this case) other than the position where said through hole is opened (Fig. 8B, [0065]).

Takao does not disclose:

- forming an insulating resin layer on all of at least one surface of said through wiring board except for the area where said through hole is opened and wherein said insulating resin layer is not formed on any surfaces in said through hole.

- forming a through extension wiring on "said at least one surface of said insulating resin layer".

Hanaoka discloses:

- forming an insulating layer (40) on all of at least one surface (bottom of Fig. 6B, for example) of said through wiring board (6) except for the area (52) where said through hole (4) is opened and wherein said insulating layer is not formed on any surfaces in said through hole (Fig. 7A, for example) ([0142-0149]).

- forming a through extension wiring (8/18) on (indirectly) said at least one surface of said insulating resin layer (40) (Figs. 10A, [0123], [0149-0152], [0165]).

Including layer 40 of Hanaoka in the device of Takao implicitly meets the limitations as claimed, since as understood, said layer 40 of Hanaoka is included in Takao prior to defining the through extension wiring and through hole).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to include the steps and insulating layer of Hanaoka to the method of Takao so

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as to enable means for forming a through hole in a patterning method as disclosed by Hanaoka.

Takao/Hanaoka fails to disclose:

- said insulating layer as "an insulating resin layer".

Hwang discloses:

- an insulating resin layer (108, [0026], [0028]). The examiner relies in Hwang for disclosure of a suitable/known layer used in a patterning method applicable to that of Takao/Hanaoka).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to include the insulating resin layer of Hwang to the method of Takao/Hanaoka so as to employ a known and suitable material employed in patterning methods and capable of withstanding processing conditions as disclosed by Hwang.

**Re claim 15**, Takao/Hanaoka/Hwang discloses (see Takao) an insulating layer (30) is provided between said board (10) and at least said through wiring and said through extension wiring (20/21) (Fig. 5, [0059]); and

further comprising a seed layer (18) disposed between the insulating layer (30) and the through extension wiring (20/21) (Fig. 5, [0060]).

**Re claim 17**, Takao/Hanaoka/Hwang discloses (see Takao) forming an insulating layer (30) is provided between said board (10) and at least said through wiring and said through extension wiring (20/21) (Fig. 5, [0059]); and

forming a seed layer (18) disposed between the insulating layer (30) and the through extension wiring (20/21) (Fig. 5, [0060]).

### ***Response to Arguments***

9. Applicant's arguments filed 02/23/2011 have been fully considered but they are not persuasive. Argument(s) based on the newly added limitation(s) is/are addressed in the above rejection. Regarding Imaoka, the examiner notes that the insulating resin layer relied upon in the rejection above is layer 26, not layer 36. Regarding Hanaoka (Takao/Hanaoka/Hwang), the examiner notes that the insulating resin layer relied upon in the rejection above is the insulating layer 40 of Hanaoka, not layer 10, wherein said insulating layer 40 is a "resin" per Hwang as addressed above.

### ***Additional Remarks***

10. The examiner notes the prior art of record does not appear to disclose or suggest features of Fig. 12 and [0106] of the pre-grant publication. For example (in combination with the limitations of claims 4 and 6): the insulating resin layer 14 formed on all of both a top and a bottom surface of the through wiring board 7, the top and bottom surfaces being on opposite surfaces of the through wiring board 7, and, the through extension wiring 13 and bumps 15a/15b formed on both the top and bottom surfaces of the through wiring board.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andres Muñoz whose telephone number is (571) 270-3346. The examiner can normally be reached on 7:30am - 4:00pm (Mon-Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Nguyen can be reached on (571) 272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Andres Muñoz/  
Examiner, Art Unit 2894  
April 8, 2011

/Kimberly D Nguyen/  
Supervisory Patent Examiner, Art Unit 2894